Awareness of Pregnant Women regarding iodine deficiency

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Abstract:

Back ground: awareness of pregnant woman about iodine deficiency is a very important issue since it cause a wide spectrum disorders include still birth, increase number of spontaneous abortion, congenital abnormalities, and irreversible mental retardation to the fetus. **Aim:** To assess pregnant woman's awareness regarding iodine deficiency. **Subject and method: research design:** a descriptive study design was used. **Subject:** a purposive sample of 350 pregnant women was recruited in the study. **Setting:** the study was conducted at outpatient antenatal clinic at Central Touch Hospital, Qalyubia. **Tool of data collection: include:** 1-pregnant woman's general characteristics tool. 2- pregnant woman's past and current medical and obstetric history tool. 3- assessment pregnant woman's knowledge regarding iodine deficiency tool. **Results:** it revealed that more than three quarters of the study sample had unsatisfactory knowledge regarding iodine deficiency and about one quarter of them had satisfactory knowledge and there were a statistical significant relation between studied sample demographic characteristics and their total level of knowledge regarding iodine deficiency. **Conclusion:** The current study reveals that, more than three quarters of the studied sample had unsatisfactory knowledge regarding iodine deficiency disorders and about one quarter of them had satisfactory knowledge. **Recommendations:** Strategies should include nutritional educational programs for pregnant women to improve their knowledge regarding iodine deficiency.

Key words: Awareness, pregnant women, iodine deficiency.

Introduction:

Pregnancy is a time of great uncertainty and physical changes experienced by the woman during her pregnancy. She may need explanation and reassurance to help her cope with a wide variety of symptoms including nausea, heart burn, dizziness, shortness of breath, abdominal discomfort, and backache **(Bright & Becker, 2019).** Also, Pregnancy is one of the most important periods in life when increased micronutrients, and macronutrients are needed by the body; both for the health and well being of the mother and for the growing fetus and newborn child **(Darnton-Hill & Mkparu, 2015).**

Iodine is a trace element present in the human body in minute amounts (15-20 mg in adults, principally in the thyroid gland **(EFSA, 2014). A**n essential micro nutrient, occurs naturally as its iodide and iodates (mineral forms) and can be found in sea water, marine plants and soil. Iodide ions in sea water are oxidized and subsequently volatilized in the atmosphere and return to the soil by rain, thus completing the cycle **(Antonyak et al., 2018).**

Iodine (atomic weight 126.9g\ atom) is an essential component of the hormones produced by the thyroid gland. Thyroid hormones, and there for iodine is essential for mammalian life **(Eastman & Zimmermann, 2018).**

Dietary iodine requirements are increased in pregnancy due to increased thyroid hormone production, increased renal iodine losses, and fetal iodine requirements. Iodine

requirements are increased ≥ 50% during pregnancy **(Pearce & Caldwell, 2016).**

Pregnant women are at higher risk due to the critical role of iodine in producing thyroid hormones, brain growth and development, and fetus nervous system. Iodine deficiency during pregnancy can cause many problems such as congenital defects, abortion, stillbirth, increased premature mortality, mental and physical growth disorders, goiter, deafness, and muteness, bilateral lower limb paralysis, strabismus, and hypothyroidism. In addition, iodine deficiency in mothers causes complications such as goiter and hypothyroidism **(Velasco, Bath & Rayman, 2018).**

Iodine deficiency has been described as the single greatest cause of preventable mental impairment, with nearly 1.9 billion people estimated to have an inadequate dietary iodine intake **(Doggui & El Atia, 2015)**. Iodine is essential for the production of thyroid hormones, thyroxine and triiodothyronine, required for the control of metabolic processes and growth and development, especially of the brain and central nervous system. Iodine deficiency throughout the life cycle can result in a range of adverse consequences termed iodine deficiency disorders (IDD) **(Zimmermann, M.B, 2011).**

Justification of the study:

The world health organization considers iodine deficiency to be the single most important preventable cause of brain damage world wide.approximately 1/3 of the world's population is estimated to have insufficient iodine intake, in particular in south east Asia and Europe. in iodine deficient regions, however, potentially inadequate iodine stores are rapidly depleted during pregnancy, leading the fetus to be at risk for developmental impairment, especially in the brain. Severe iodine deficiency during pregnancy may cause cretinism which may include mental retardation as well as speech and hearing impairments **(Biesalski et al., 2016).**

In Egypt the overall prevalence of hypothyroidism among mothers with iodine deficiency was 15.15%. however, in women with limited thyroid reserve, due to iodine deficiency, hypothyroidism can develop **(Bekhit & Yousef, 2013).**

So this study was conducted to assess pregnant woman's awareness regarding iodine deficiency

Aim of the study:

The Aim of this study was to asses pregnant woman's awareness regarding iodine deficiency.

Research question:

Are pregnant women aware about iodine deficiency?

Subject and method:

1-Technical design:

The technical design used for the study involved the following items, research design, setting of the study, sample of the study, criteria of sampling size and tools for data collection.

Research design: A descriptive study design was used.

Setting: The study was conducted at outpatient antenatal clinic at Central Touch Hospital, Qalyubia.

Type of sample: Purposive sample.

Sample size: 350 from total flow rate of pregnant women attended at antenatal outpatient clinic at Central Touch Hospital at year (2018-2019) was 4000.

Sample size was calculated using the equation:

$$n = [DEFF*Np(1-p)]/[(d^2/Z^2_{1-\alpha/2}*(N-1)+p*(1-p)]$$

As

n: The desired sample size.

N: (Total population according to last annual statistical report in touch hospital) =4000

P: The proportion in the target population to have a specific characteristic. If no estimate available set at 0.5

d: Absolute precision or accuracy, normally set at 0.05

Z: The standard normal deviate usually set at 1.96 (which corresponds to the 95% confidence level) produced sample size was 350 cases.

Criteria for sampling:

1-In first trimester regardless age, education, gravidity

Tools of data collection:

Tool no. I- structured interviewing questionnaire:

This tool was developed by the researcher based on review of related literatures, it was utilized to assess women awareness regarding iodine deficiency. Its divided into three parts the questions were close ended questions as well as multiple choice questions.

Part 1:

This part was designed to assess the study sample general characteristic (demographic data eg; age of the pregnant women, Place of residence, educational level, and occupation if present).

Part 2:

This part include woman's past and current medical and obstetric history.

Part 3:

To asses knowledge of pregnant women regarding iodine deficiency which composed of 5 closed ended questions eg (Can iodine deficiency cause growth retardation for children?) and 21 multiple choice questions as (iodine is important to) adopted from (**Garnweidner-Holme et al., 2017; Combet et al., 2015)**.

Scoring system for knowledge:

- Correct answer will be given 2 score
- Incorrect answer will be given 1 score

Total knowledge score will be calculated as following:

- Knowledge will be consider satisfactory if it was equal, more than 60%
- Unsatisfactory if it was less than 60%.

Tool Validity:

These tools were reviewed by jury committee (3 experts from maternal and gynecological nursing field at faculty of nursing Ain Shams University)to test its content and face validity then accordingly some questions were modified and other canceled.

Reliability: test then retest after two weeks for the same sample.

Administrative design:

An official approval was obtained from the maternal and gynecological nursing department counsels and the scientific research ethical committee that were approved by the faculty of nursing, Ain Shams university counsel.

Also a letter containing the title and aim of the study was directed to the director of central Touch hospital to obtain approval for data collection.

3-Operationa design:

The operational design included the preparatory phase, pilot study and field work.

Preparatory phase:

It includes reviewing past, current, local and international related literature and theoretical knowledge of various aspects of the study using books, articles, internet, and magazines to develop tools for data collection.

Ethical consideration:

The aim of the study was explained to each pregnant woman before applying the tools to gain her confidence and trust.an oral consent was obtained from each women to participate in the study, after ensuring that data collected will be treated confidentially.

The study doesn't entail any harmful effects on participating pregnant woman or their fetus.

All participate women were informed that they have the right to withdraw from the study at any time without having a rational.

Pilot study:

A pilot study is conducted on (35)pregnant women which represented 10% out of total sample size to ensure the clarity, applicability and the time needed, the pilot sample was excluded from the main study sample because modification was done for some words and sentences.

Field work:

- The actual field work for the process of data collection has consumed four months (from February 2019 to May 2019).
- Data was collected in 3 days per week from 9 am to 2 am average from 8-10 pregnant women a day.
- -At the beginning of the interview the researcher started to introduce herself, briefly explained the aim of the study to pregnant women to gain their confidence and trust to convince them to participate in the study.
- Oral consent was obtained from each women

- Interview women was conducted by using the interviewing Arabic questionnaire within (15-20 minutes)to asses pregnant women general characteristics, past and current medical & obstetric history and knowledge regarding iodine deficiency.
- Each pregnant women interviewing Arabic questionnaire was completed within (15-20 minutes).

4-Statistical design:

The collected data is organized, analyzed using appropriate statistical significant tests. The data were collected and coded. Using the Computer Statistical Package for Social Science (SPSS), version 20.0 did the statistical analysis of data.

I- Descriptive Statistics:

1. Mean and Standard deviation (+ SD) for parametric numerical data.
2. Frequency and percentage of non-numerical data.

II- Analytical Statistics:

1- Chi square test is used to examine the relationship between two qualitative variables:

- The confidence interval was set to 95% and the margin of error accepted was set to 5%. So, the p-value was considered significant as the following:
- Probability (P-value)

— P-value <0.05 was considered significant.

— P-value <0.001 was considered as highly significant.

— P-value >0.05 was considered insignificant.

Limitation of the study:

Waiting area was crowded and noisy with patient which lead to interruption during assessment.

Results

Demographic data:

Table (1): Number and percentage distribution concerning woman's general characteristics among studied sample (N=350)

General characteristics	Total number= 350	
	No	%
Age (years)		
<20 yrs.	35	10%
20 – <30 yrs.	202	57.7%
30-40 yrs.	93	26.6%
>40 yrs.	20	5.7%
Educational level		
Illiterate	58	16.6%
Primary	45	12.8%
Middle	91	26%
High	156	44.6%
Family income / month		
<1000 pound	91	26.0%
>1000 pound	259	74.0%
Period of marriage		
1-<5 yrs.	93	26.6%
5- <10 yrs.	217	62%
≥10 yrs.	40	11.4%
Working status		
Working	71	20.3%
House wife	279	79.7%
Residence		
Rural	274	78.3%
Urban	76	21.7%

Table (1) had revealed that more than half of the study sample (57.7%) aged between 20-<30 yrs, about one half (44.6%) had high level of education, and about two third of them (74%) their income >1000 pound/month. regarding residence, table (1) also shew that more than three quarter of the studied sample

(78.3%) lived in rural areas, and more than one half of them (62%) had married from 5-<10 yrs while more than three quarter of them (79.7%) were not working.

Table (2): Number and percentage distribution of studied sample according to their current medical & obstetric history.(n=350)

Current medical & obstetric history	N= 350	
	No	%
Medical problems		
Hypothyroidism	4	1.1%
Thyroid hyper activity	4	1.1%
No problems	342	97.7%
Pregnancy problems		
Gestational hypertension	8	2.3%
No problems	342	97.7%
Number of previous labors		
1	44	12.6%
2	173	49.4%
3	55	15.7%
4	11	3.1%
No previous labors	67	19.1%
Current gestational age		
8wks	30	8.6%
9	58	16.6%
10	66	18.8%
11	58	16.6%
12	138	39.4%
Drugs for treatment of iodine deficiency disorders		
Yes	8	2.3%
No	342	97.7%

Table (2) had demonstrated that the majority of the studied sample didn't have any current medical problems while few of them (1.1%) had hypothyroidism and another few (1.1%) have thyroid hyperactivity.

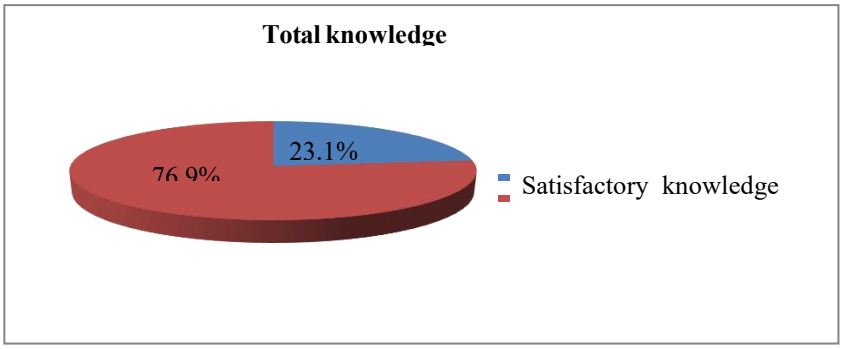
Concerning pregnancy problems, the majority of the studied sample haven't problems while few of them (2.3%) have gestational hypertension. regarding number of previous labors table (2) had illustrated that about one half of the studied sample (49.4%) have two previous labors and few of them (3.1%) have four previous labors, also this table had revealed that all the studied sample were in the first trimester and the majority of them were 12 wks gestation, concerning using drugs for treatment of iodine deficiency disorders, the majority of the studied sample didn't use any drugs but few of them (2.3%) use (Eltroxin and Propylthiouracil).

Table (3): Number and percentage distribution of studied sample according to source of knowledge about iodine (n=350):

Source of knowledge about iodine	N=350	
	No	%
Family	16	4.6%
Internet	38	10.8%
Friends	11	3.1%
Health care provider	12	3.4%
No knowledge	273	78.1%

Table (3): had demonstrated that the majority of the studied sample (78.1%) have not any previous knowledge about iodine, while (4.6%) of them have knowledge from family, (10.8%) their source of knowledge about iodine were the internet, (3.1%) have knowledge from friends and finally (3.4%) of the studied sample source of knowledge were the health care provider.

Figure (1):



Figure(1): had demonstrated that more than three quarter (76.9%) of the studied sample had unsatisfactory knowledge while about one quarter (23.1%) had satisfactory knowledge.

Table (4): Relation between pregnant women general data and their total level of knowledge about iodine deficiency (n=350)

Socio-Demographic data	Total Knowledge				Chi-square test	
	Satisfactory knowledge (n=81)		Unsatisfactory knowledge (n=269)			
	No.	%	No.	%	x2	p-value
Age (years)						
<20 years	9	11.1%	26	9.7%		
>40 years	1	1.2%	19	7.1%	10.177	0.017*
20-<30 years	57	70.4%	145	53.9%		
30-<40 years	14	17.3%	79	29.4%		
Educational level						
Illiterate	0	0.0%	58	21.6%		
Primary education	0	0.0%	45	16.7%	60.081	<0.001**
Middle Certification	17	21.0%	74	27.5%		
High education	64	79.0%	92	34.2%		
Family Income						
<1000 LE	0	0.0%	91	33.8%	37.029	<0.001**
>1000 LE	81	100.0%	178	66.2%		
Period of Marriage						
1-<5 years	17	21.0%	76	28.3%	13.144	0.023*
5-<10 years	37	45.7%	180	66.9%		
>10 years	27	33.3%	13	4.8%		
Residence						
Rural	48	59.3%	226	84.0%	20.111	<0.001**
Urban	33	40.7%	43	16.0%		
Job						
House wife	56	69.1%	223	82.9%	7.293	0.007*
Worker	25	30.9%	46	17.1%		

p-value >0.05 NS; *p-value <0.05 S; **p-value <0.001 HS

Table 4: This table shows that there were **statistical significant relation** between the studied women level of knowledge about iodine deficiency and their **age**, **level of education, family income, period of marriage, residence and job**, with p-value (p<0.05).

Table (5) Relationship between pregnant woman's total level of knowledge and source of

knowledge about iodine (n=350)

Source of knowledge about iodine	Total Knowledge				Chi-square test	
	Satisfactory knowledge (n=81)		Unsatisfactory knowledge (n=269)			
	No.	%	No.	%	x2	p-value
Family	3	3.7%	13	4.8%	0.426	0.980
Friends	2	2.5%	9	3.3%		
Internet	5	6.2%	33	12.3%		
Medical care Provider	8	9.9%	4	1.5%		
There is no	63	77.8%	210	78.1%		
Total	81	100.0%	269	100.0%		

p-value >0.05 NS

Table 5: This table shows that there were no **statistical significant relation** between the studied women level of knowledge about iodine deficiency and their **source of knowledge**, with p-value (p<0.05).

Discussion:

Iodine is a nutrient essential for synthesis and secretion of thyroid hormones, regulation of basic metabolism, and growth of nervous, cognitive and movement system, iodine is of great importance as a nutrient in certain groups, such as pregnant women **(Eastman & Zimmermann, 2018).**

The present study is a descriptive one that aimed to assess pregnant woman's awareness regarding iodine deficiency during pregnancy at central Touck hospital. Regarding to the demographic characteristics of the study sample, the current study revealed that more than half of the study sample aged between 20-<30 years, about one half had high level of education and about two third of them their income > 1000 pound/month. More than three quarter of them living in rural area, and more than one half had married from 5-<10 years, while more than three quarter of them weren't working. Similar demographic characteristics in a study by **Simpong et al., (2016)** who found that the age of the pregnant women involved in the study were >20-≤40 yrs. with mean age 27.20± 5.99 yrs., and the majority (95%) of the participants had no formal occupation fewer participants had formal occupation (5%).

Regarding level of education it was found that about half of the study sample had high education while in a study conducted by **Bouga, Lean & Combet (2018)** about Contemporary challenges to iodine status and nutrition: the role of foods, dietary recommendations, fortification and supplementation in UK, the educational level of the studied sample were, school level (6%), college level (13%), undergrad-duate degree (50%) and post graduate degree (29%). In the current study, more than three quarter of the study sample lived in a rural area, this is contrast with the study of **(Metawea, 2016)** that were conducted about knowledge of female adolescent about risks of iodine deficiency during pregnancy, the majority of the studied sample came from urban areas, but the current study was similar to the study of **Abuye & Berhane, (2007)** while the majority of the women in the study were from rural areas.

Regarding the current medical and obstetric history of the studied sample:

The results of the present study revealed that the majority of the studied sample neither had medical problems nor obstetric problems in their current pregnancy, and half of them have two previous labors and all the studied sample were in the first trimester, and the majority of them don't take any drugs for treatment of iodine deficiency disorders. This was in contrast with **Simpong et al., (2016)** who conducted a cross sectional study about Assessment of iodine Status among pregnant women in a rural community in Ghana, who found that one half (50%) of participants were in their first trimester and (41.9%) in their second and third trimester. also it came along with **Sangsefidi, et al., (2016-2017)** who conducted a study about pregnant woman's

iodine status and their knowledge, attitude, and practice towards iodized salt in Esfarayen and Jajrom cities among pregnant women in the first trimester and they didn't use any antithyroid drugs.

Regarding number of previous labors, current study revealed that half of the studied sample have two previous labors while in a study conducted by **Bouga, Lean & Combet (2018)** found that (31%) of the studied sample were nulliparous or expecting first, (56%) were Para 1 and (13%) of them were para2 or more.

Regarding source of knowledge about iodine, the present study revealed that the majority of the studied sample (78.1%) didn't hear about iodine or didn't have previous knowledge about iodine. This is similar to a study conducted by **Al Hadid, AlRajabi & Al Barmawi (2018)** about the relation ship between iodine nutrition, thyroid function, and obstetrical outcomes for Jordanian pregnant women, who found that the majority of the study sample had no source of information and the few of them had information from nursing students, internet and mass media, books and magazines, friends and family.

Also **Bouga, Lean & Combet (2018)** reported that only 23% of the studied sample had heard about iodine and the majority (78%) hadn't heard about iodine before.

ÇİN & ÖZÇELİK, 2020 found that (50.7%) of participants stated that they received information about iodine nutrition. They received information from the internet (44.7%), the health care personnel (35.6%), TV (13.2%), relatives and friends (3.9%) and books (2.6%).

Regarding the total knowledge about iodine among the studied sample:

Among the most challenging issues concerning iodine deficiency, is the knowledge of the women about the key role of iodine for their health and the fetus development. **Charlton, et al. (2012)** argued that poor knowledge about iodine is a main contributor to hypothyroidism among pregnant women. Unfortunately, it was estimated that approximately two billion people in 2013 were either having or facing the risk of developing iodine deficiency around the world **(WHO, 2014)**.

Low maternal and paternal knowledge, poor economic status, history of poor maternal iodine consumption, place of residence, and large-size families are significantly associated with iodine deficiency-related conditions **(Yohannan, Mathew & Szlachetko, 2018).**

The present study revealed that about one quarter of the pregnant women have satisfactory knowledge and more than three quarters of them had unsatisfactory knowledge about iodine deficiency during pregnancy, this is similar to a study conducted by **Lowe et al., (2015**), about one third of respondents felt that iodine deficiency was serious, one fifth that it wasn't serious, and quarter didn't know.

The current study disagree with **Wiwanitkit, (2014**), who found that all study sample replied that they had knowledge about IDD but none could describe the symptoms of the disorder nor could recall ever seeing such a patient because educational level significantly affected level of knowledge about iodine deficiency risks.

Also the present study was in the same line with a study conducted by **(Garnweidner-Holme et al., 2017)** who found a lack of knowledge about iodine in pregnant women.

Abraham, 2018, in his study found that, the majority (76%) of the participants had poor knowledge and none of them had excellent knowledge.

Similar to this study, a community based survey conducted in Orissa, India to determine the status of iodine nutrition and knowledge of iodine deficiency disorders, showed over 80% of respondents didn't have knowledge of IDD and weren't aware of salt iodization.

Regarding Relationship between demographic data and total level of knowledge about iodine deficiency:

In the present study there were statistical significant relation between studied women total level of knowledge about iodine deficiency and their age, level of education, family income, and period of marriage, residence and job.

This in contrast with a study conducted by **(Abraham, 2018)**, who stated that there were no statistical significant association between studied sample knowledge and demographic variables such as (age, marital status, educational status, occupation, and type of family).

Regarding relationship between studied sample educational level and their total level of knowledge about iodine deficiency:

In the present study, there were statistical significant relation between studied sample level of education and their total level of knowledge about iodine deficiency.

In the same line with the present study, a study conducted by **(Garnweidner-Holme et al., 2017)**, who found that (38.3%) of pregnant women had high educational level, pregnant women having higher educational level significantly increased probability of being in the upper tertile of the knowledge score.

Also (**ÇİN & ÖZÇELİK, 2020)** found that as the education level of participants increased, mean knowledge scores also increased.

This study in contrast with a study conducted by **(Lucas et al., 2020)** in Australia about (Are pregnant women being adequately informed about iodine and nutritional supplementation?) it was reported that educational level didn't affect iodine knowledge score.

From the researcher point of view, in the present study about one half of the study sample had high educational level and this increase the total level of knowledge of the study sample about iodine deficiency, **this may be due to**, education provides more opportunities to learn from the salvation of different subjects and cultures while using the internet and all available means to obtain information easily. And during pregnancy their higher education gives them opportunity to read about what benefits the pregnant woman and that affect development of her fetus.

Also higher education increases the culture that affect the thinking and the mother begins to follow up and make the necessary planning to exit the pregnancy and health of the fetus to safety through obtaining information via internet, reading books, or attending educational seminars and follow up with obstetric and gynecological specialist.

Regarding relationship between studied sample age and their total level of knowledge about iodine deficiency:

There were statistical significant relation between studied sample age and their total level of knowledge about iodine deficiency. This is disagreement with **(ÇİN & ÖZÇELİK, 2020)** who found that the mean iodine knowledge score was higher in participants aged 19-30 compared to 31-45 years.

From the researcher point of view in the present study the increased in age increases the total level of knowledge, **this may be due to** the higher the age the greater experience in the life and through the experiences of others and similar situation people gain information.

Regarding relationship between studied sample place of residence and their total level of knowledge about iodine deficiency:

There were statistical significant relation between studied sample place of residence and their total level of knowledge about iodine as participants who lived in rural areas have low level of knowledge about iodine

The present study came in the same line with **Aruna et al.,(2013)**, who reported that the mean general knowledge score regarding of IDD among women was 8.54, the score being higher among urban women compared to rural

women and this difference was highly significant ($p< 0.01$).

Also, Abuye and Berhane, (2007), found that rural women were significantly ($P< 0.001$) affected by goiter than women in urban or semi-urban setting and this may be due to difference in knowledge about sources of iodine among people in rural areas.

From the researcher point of view in the present study pregnant women who lived in a rural areas had low level of knowledge than pregnant women who lived in urban areas, **this may be due to** low culture of rural areas came as a result of difficult socioeconomic conditions that affect the course of life starting from children not going to school or leaving school early for work at fields to increase the income and thus prevent them from the ability to can read books, magazines, journals and gaining information from them they don't have any means of knowledge. and there are some bad customs and traditions of not following up with specialist doctors and giving birth at home.

Regarding relation-ship between studied sample total level of knowledge about iodine and their source of knowledge about iodine:

There were no statistical significant relation between the studied women level of knowledge about iodine deficiency and their source of knowledge, with p-value ($p<0.05$). similar to this study, a study conducted by **Abraham (2018)** on 150 antenatal women from selected rural area at Kottayam District, Kerala, about Facilitating knowledge of women on importance of iodine in fetal brain development: An evidence based practice educational intervention who found that there were significantly no association between knowledge and the source of information among participants.

From the researcher point of view, the majority of the studied sample (78.1%) didn't have previous knowledge about iodine this may be due to, their family and friends don't have enough knowledge about iodine deficiency to provide the pregnant women with suitable information and the pregnant women don't have enough experience on internet to get correct information about iodine deficiency, also they aren't following the medical provider regularly to get the best information about iodine deficiency so the researcher advice to arrange more scientific information through health care services, TV and social media to improve their knowledge.

Conclusion:

According to the results of this study, it can be concluded that:

The current study revealed that, three quarters of the studied sample had unsatisfactory knowledge regarding iodine deficiency disorders and about one quarter of them had satisfactory knowledge.There were many factors that affected the total knowledge of the study sample regarding iodine deficiency disorders including; demographic characteristics as (place of residence, level of education and age differences) and obstetric history or factors.

Recommendation:

On the light of the findings of the study, the following are recommended:

1. Strategies should include nutritional educational programs for pregnant women to improve their knowledge regarding iodine deficiency.
2. A suggestion for further study is to assess the iodine status of pregnant women which could include the determination of Urinary iodine concentration (UIC) levels as recommended by WHO.

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